



COS Summer 2024 Working Group Final Report: The Future of IB

July 31, 2024

Department of Integrative Biology | College of Sciences

Table of Contents

EXECUTIVE SUMMARY	4
A. INTRODUCTION.....	5
Background	5
Working Group Charge	5
Working Group Members.....	6
B. DEPARTMENT INFORMATION.....	7
C. RE-VISIONING THE DEPARTMENT OF INTEGRATIVE BIOLOGY	8
A Call to Action.....	8
Proposed Department Concept	9
Mission Statement.....	9
Vision Statement.....	9
Core Targets	10
Departmental Objectives	10
Global Challenges.....	11
Impacts of Environmental Change on the Health of Humans, Animals, Plants, and Ecosystems	12
Biodiversity Loss.....	12
Water Systems Integrity.....	12
Healthy Urban Systems.....	12
Transforming Science & Pre-Health Education.....	12
Collaborative Centers & Consortia.....	13
Science Education Advancement (SEA) Consortium.....	13
COS Pre-Health Student Training Center	14
Organizational Structure	15
D. STRATEGIC PLANNING & IMPLEMENTATION.....	16
Existing Departmental Strengths	16
Strategic Priorities.....	16
Fundamental and Applied Insights	16
Preparing the Next Generation of Scientists, Educators, & Health Practitioners.....	17
Building Transdisciplinary Partnerships	18
Translating Research into Practice.....	19

Tentative Timeline 21

E. CONCLUSIONS & RECOMMENDATIONS 24

 Working Group Conclusions & Recommendation 24

 Potential Challenges 25

 A Path Forward 26

REFERENCES 27

EXECUTIVE SUMMARY

The Summer 2024 COS Working Group was formed to provide recommendations to college and university leadership regarding the future trajectory of the Department of Integrative Biology (IB). This Working Group, comprised of 12 IB faculty members, met weekly in June-July 2024 and built upon the conclusions of the Fall 2023 COS Working Group and subsequent faculty discussions. Specifically, the working group took a comprehensive approach to developing and evaluating a new department concept proposed by IB faculty and staff in Spring 2024. This approach centered on strategic planning and participatory processes, taking into account student needs and interests and repeatedly seeking input from all IB faculty and staff.

It is the unanimous recommendation of the working group to move forward with the proposed concept and re-vision the Department of Integrative Biology as the Department of Biology, Health, and the Environment. The re-visioned department will focus on solving the health and sustainability challenges of the 21st century through inter-disciplinary research in biological systems, transformative education, and the One Health paradigm—an approach that recognizes the importance of understanding and harnessing the connections between the health of humans, animals, plants, and the environment. As one of the first departments of its kind, the re-visioned department will be placed at the forefront of a movement transforming how universities train the scientists, educators, and health professionals of the future, and it will support all three UTSA strategic destinations.

The re-visioned department concept has widespread departmental support, aligns with the interests of students, faculty, and funding agencies, builds upon existing department strengths, and provides increased clarity of focus and identity formation. With 2,695 majors and a large service role in pre-health and core education, IB serves over 20% of UTSA's students each year. The majority of these students are interested in careers in health and/or sustainability. Likewise, IB's successful funding record in fields that support the proposed vision (\$11 Million in 2023), suggests that the external support exists to provide a solid foundation for the proposed department.

A. INTRODUCTION

Background

In Fall 2021, the Department of Integrative Biology (IB) was created by combining the Department of Environmental Science and Ecology with a subset of faculty from the former Department of Biology. IB currently possesses faculty with expertise in diverse fields, including: genetics, cell biology, biochemistry, microbiology, organismal physiology and anatomy, endocrinology, medical sciences, epidemiology, evolutionary biology, animal behavior, plant biology, wildlife science, ecology, environmental science, and science education. The IB Department offers undergraduate and graduate programs in biology and environmental science as well as undergraduate programs in environmental studies and secondary science teacher preparation.

In Fall 2023, a [College of Science Working Group](#) met to evaluate a proposed move of Environmental Science (ES) programs and faculty from the Department of Integrative Biology to the Department of Earth and Planetary Sciences (EPS). The COS working group's [recommendations](#) indicated that there was not a clear consensus for moving ES programs and suggested that involved departments would benefit from a visioning/re-visioning process.

In Spring 2024, faculty and staff within the Department of Integrative Biology continued this process by holding several meetings focused on the re-visioning of IB, in collaboration with COS Interim Dean John Frederick and Dr. Kasey Neece-Fielder, Associate Vice-Provost for Strategic Planning and Assessment. In Summer 2024, a formal working group was created to continue this work.

Working Group Charge

The Summer 2024 COS Working Group built upon faculty discussions held in Spring 2024 in order to provide recommendations to college and university leadership regarding the Department of Integrative Biology's future trajectory. The initial charge for this group included the following tasks:

1. Suggest a new department name that is inclusive of all of IB's programs and representative of its future trajectory.
2. Draft new departmental mission and vision statements that reflect departmental strengths in health, sustainability, and science education.
3. Recommend an organizational structure that aligns best with the new department re-visioning.
4. Identify strategic target areas for development in order to maximize student success and research excellence.
5. Propose possible collaborative partners for the purpose of developing curriculum and interdisciplinary programs (e.g. other departments, colleges, external agencies).
6. Explore potential roles for IB in the development of a STEM education consortium at UTSA.

Final deliverables were completed and recommendations made to Interim Dean Frederick on July 31, 2024.

Working Group Members

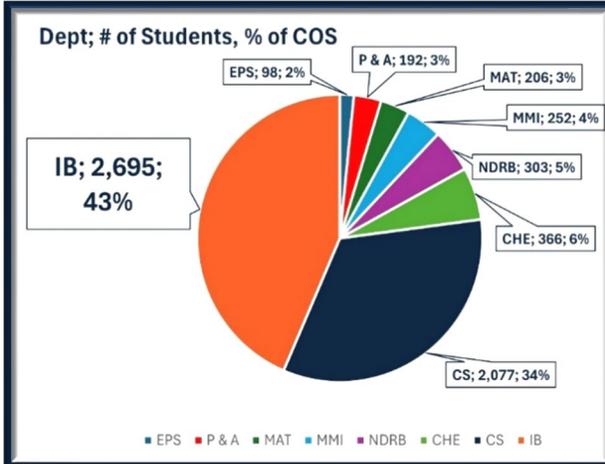
The Future of IB Working Group met weekly in June-July 2024. Members of the working group included:

- Dr. Edwin Barea-Rodriguez, Professor
- Dr. Janis Bush, Professor & Interim Department Chair (2024-25)
- Dr. J. Aaron Cassill, Professor & Assistant Department Chair
- Dr. Jurgen Engelberth, Associate Professor
- Dr. Eddie Hernandez, Professor of Instruction & Undergraduate Advisor of Record
- Dr. Mariah Hopkins, Professor of Instruction & Assistant Department Chair (Working Group Chair)
- Dr. Amelia King-Kostelac, Assistant Professor of Practice
- Dr. Brian Laub, Assistant Professor
- Dr. Fernando Martinez, Associate Professor of Instruction
- Dr. Terri Matiella, Professor of Instruction, Assistant Department Chair, and Assistant Dean for Instruction, Assessment, and Faculty Development
- Dr. Jennifer Smith, Assistant Professor
- Dr. Valerie Sponsel, Professor & Graduate Advisor of Record

Sub-committees focused on four departmental themes (Human Health, Plant & Animal Health, Health of the Environment, and Science Education) and met as needed to complete specific tasks. Feedback from IB faculty and staff was solicited through two full-faculty meetings held July 11 and July 25, 2024 and via an anonymous comment form posted on the [COS working group website](#). Student needs and perspectives were drawn from surveys and focus groups completed previously by the Fall 2023 COS Working Group.

B. DEPARTMENT INFORMATION

**LARGEST DEPT AT UTSA-
Contacts >20% of UTSA each year
(7,774 students in 23-24)**



**AWARD-WINNING TEACHING –
558 Organized Courses/Year**

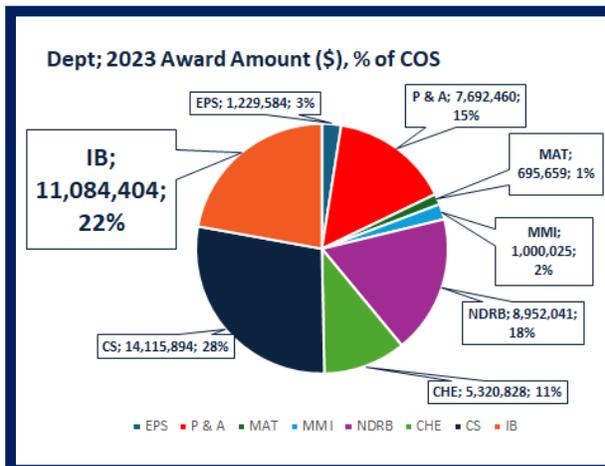
**53 Faculty (12 TT/T) Teaching
44,563 SCH of 182,785 SCH in COS**

Academy of Distinguished Teaching Scholars	Faculty with UTSA Presidential Awards	ACUE Fellows
2	4	9

**SIX DEGREE PROGRAMS & TWO
GRADUATE CERTIFICATES**

**RESEARCH EXCELLENCE-
Second Largest Award (\$) Amount
in College of Sciences (2023)**

**2023 Award Average:
\$953,200 per Research Active
Faculty Member**



B.S. Biology
(Concentrations in Pre-Medical Sciences,
Ecology, Plant Biology, 7-12 Grade Teacher
Certification)

B.S. Environmental Science
B.A. Environmental Studies
**B.S. Multidisciplinary Science for
Teaching**

M.S. Biology
(Open Emphasis, Concentrations in Ecology
and Pre-Professional Human Health)

M.S. Environmental Science
(Certificates in Environmental Studies &
Environmental Sustainability)

**12 of 17 [COS Student Programs](#)
have IB Participating Faculty**

C. RE-VISIONING THE DEPARTMENT OF INTEGRATIVE BIOLOGY

A Call to Action

In the past decade, emerging threats linking the health of humans, animals, plants, and the environment have caused a growing focus in the public and private sectors on the concept of One Health.^{1,2} These threats, ranging from zoonotic disease transmission to climate change, have a basis in biological systems and impact economic, environmental, and social stability. As a result, diverse organizations such as the [WHO](#), [CDC](#), [USDA](#), [USGS](#), [FDA](#), [EPA](#), [UNEP](#), and [World Bank](#) have developed One Health Initiatives recognizing the inter-connectedness of animals, people, and the environment and calling for an integrative approach to tackle threats to health and ecosystems.³ As a department that already takes an integrative approach to studying biological systems—with strengths in health, sustainability, and science education—the Department of Integrative Biology is poised to lead in this area.



Figure 1. Example One Health Initiatives across public-private sectors.

Proposed Department Concept

In response to growing societal need, we propose re-visioning the Department of Integrative Biology as the Department of Biology, Health, and the Environment to focus departmental efforts on tackling challenges at the intersection of human, animal, plant, and environmental health.

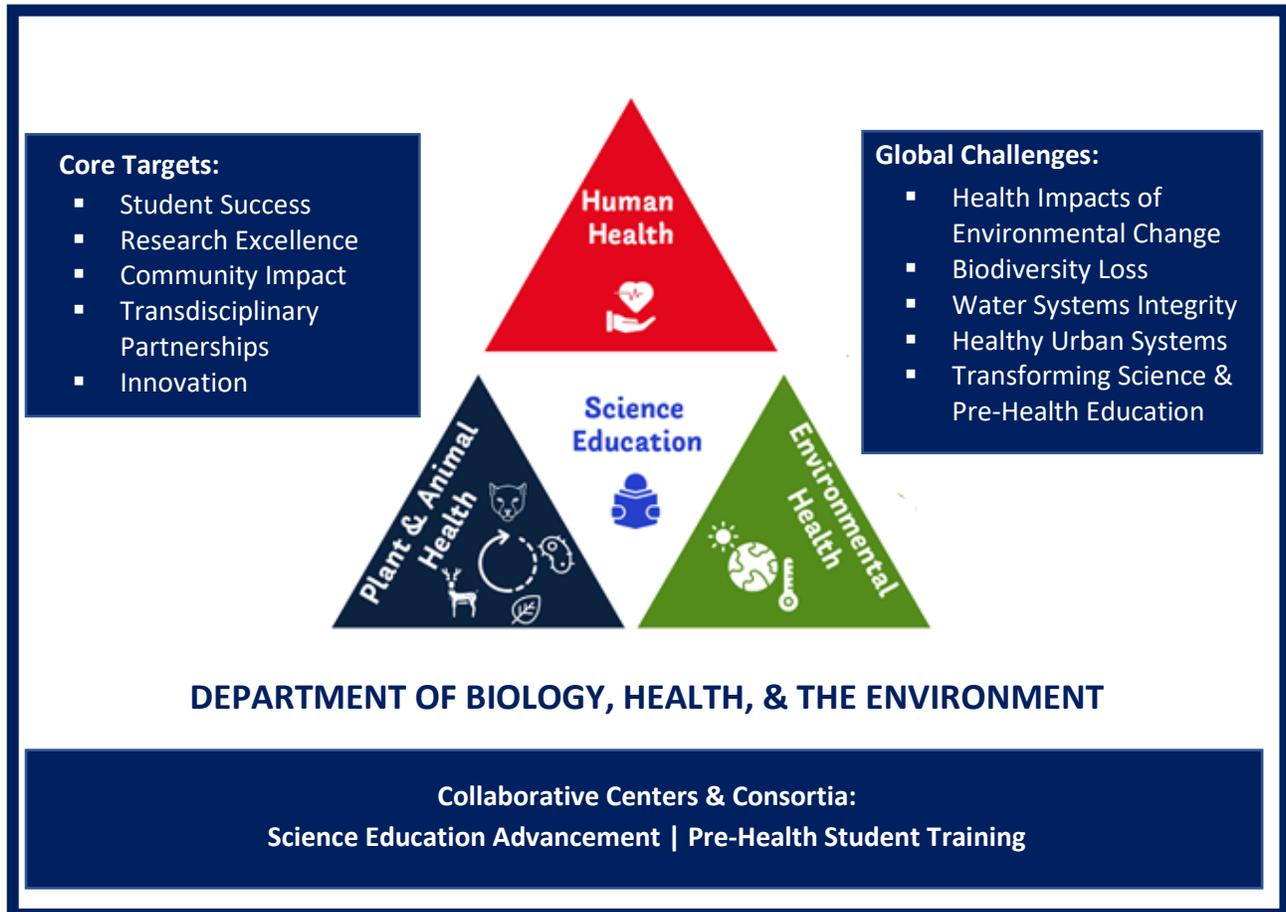


Figure 2. Re-Visioning Summary

Mission Statement

We inspire and prepare current and future generations to enact positive change by solving complex multi-disciplinary challenges related to biological systems, health, and sustainability.

Vision Statement

Our department is dedicated to transformative education, pioneering research, and effective outreach in the fields of human health, plant & animal health, and health of the environment.

We are committed to advancing knowledge and fostering understanding of the intricate connections between these domains, with the ultimate goal of opening pathways of discovery related to biological systems, health, and sustainability.

In taking a multi-disciplinary approach based on innovative pedagogies and experiential learning, we aim to prepare the next generation of scientists, educators, and health practitioners to develop holistic solutions to pressing challenges ranging from emerging diseases to biodiversity loss to climate change.

Core Targets

The Department of Biology, Health, and the Environment (BHE) will support the College of Sciences' Mission and UTSA's strategic destinations by targeting the following areas:

- Student Success: We are committed to the success of our students through the implementation of innovative educational models enhancing student retention and graduation rates, science formation, and career preparedness.
- Research Excellence: We conduct collaborative inter-disciplinary research aimed at understanding connections between the health of humans, animals, plants, and ecosystems.
- Community Impact: We enact positive change in our community through educational and professional outreach and collaboration, applying research to build resilient communities.
- Transdisciplinary Partnerships: We partner with local, state, national, and international organizations in the public and private sectors to yield the outcomes with the greatest potential for transformational impact.
- Innovation: We promote innovation in research and educational pursuits by maintaining a work environment of respect, creativity, collaboration, and professionalism.

Departmental Objectives

The Department of Biology, Health, and the Environment will build upon the strengths of the Department of Integrative Biology and strategically invest in new partnerships and programs. The envisioned department will:

1. Contribute fundamental and applied insights into biological systems and the relationships between the health of humans, animals, plants, and the environment.
2. Prepare the next generation of scientists, educators, and health practitioners to develop holistic solutions to pressing problems related to health and sustainability.
3. Build transdisciplinary partnerships capable of generating transformational impact across the fields of human health, sustainability, and science education.
4. Translate research into practice through model educational initiatives, community-engaged research, and participatory processes.

Global Challenges

The Department of Biology, Health & the Environment will focus on five global challenges related to health and sustainability in the near future.



Figure 3. Global challenges addressed by the Department of Biology, Health, and the Environment to combat threats to human, animal, plant, and environmental health.

Impacts of Environmental Change on the Health of Humans, Animals, Plants, and Ecosystems

The most pressing environmental threats also present critical threats to human health.^{4,5} Climate change contributes to food insecurity, resulting in under nutrition and malnutrition.⁶ It can also lead to increased respiratory illness⁷, cardiac events⁸, and vector-borne disease⁹. Pollution yields adverse impacts on developmental, reproductive, and nervous systems.^{10,11} Land-use change alters disease dynamics, leading to increased rates of emerging and zoonotic infectious disease spread.¹²

We lead efforts to address these threats through a holistic approach based in biological systems that illuminates and harnesses the connections between human, animal, plant, and environmental health.

Biodiversity Loss

Biodiversity conservation is central to maintaining both ecosystem and human health.¹³ Biological communities that support high species richness are healthier and more productive than those that have been depleted.¹⁴ These biodiverse ecosystems provide humans with foods, medicines, and resources, such as clean air and water¹⁵; and the loss of this biodiversity increases infectious disease risk.¹⁶ Likewise, human health initiatives can contribute to the maintenance of healthy ecosystems, as poor health and low access to affordable healthcare can be drivers of biodiversity loss.¹⁷

We study biological systems at all levels to inform management practices focused on restoring, conserving, and enhancing biodiversity.

Water Systems Integrity

Sustainable water management meets current water needs without compromising those of the future.¹⁸ Characterizing threats to ground and surface water and developing plans to mitigate these threats will rely on an understanding of the dynamics of aquatic biological systems as well as the ability to characterize and predict the reactions of these systems to physical, chemical, and biological change.

We bring biological expertise ranging from environmental microbiology to freshwater ecology to inform sustainable stewardship of aquatic systems.

Healthy Urban Systems

The health of urban areas is underpinned by complex systems ranging from healthcare to wastewater management to sustainable infrastructure and greenspace planning.^{19, 20} A One Health approach integrates connections between the health of humans, animals, plants, and the environment to shape strong communities that empower well-being. At the heart of this approach are sustainable healthcare systems that can recruit locally to provide the skilled medical care necessary to meet each community's needs.

We provide fundamental insights into the relationship between human health and urban environments and forge connections that promote and sustain strong communities in South Texas.

Transforming Science & Pre-Health Education

Generating meaningful solutions to all of the above challenges relies on impactful science education grounded in evidence-based research. A better understanding of how science is learned not only

enables us to better prepare the scientists, educators, and healthcare providers of the future; it also allows us to magnify our impact by building more effective outreach programs to disseminate our findings to diverse stakeholders with varying relationships to science and academia.

We build transformative educational programs that yield agents of change who are well-prepared to meet the health and sustainability challenges of the 21st century.

Collaborative Centers & Consortia

To maximize transformative change relative to these global challenges and to further support the College of Science's Mission and UTSA's Strategic Vision, we propose developing two new collaborative centers and consortia focused on: Science Education Advancement and Pre-Health Student Training.

Science Education Advancement (SEA) Consortium

The Science Education Advancement Consortium will facilitate cutting-edge Discipline-Based Education Research (DBER) and its implementation into the College of Sciences' programs. By coordinating and bringing teams together focused on the research of how science is learned, the SEA Consortium aims to improve student retention and graduation rates and increase the numbers of UTSA students who become career scientists.

The primary objectives of the SEA consortium will be to:

1. Unify DBER practitioners from a variety of COS disciplines.
2. Promote DBER at UTSA by initiating and coordinating teams for grant & research opportunities and implementing data and research support systems.
3. Facilitate the implementation of DBER best practices at UTSA by coupling instructional initiatives with research outcomes.
4. Consolidate and expand training programs in higher-ed STEM education within COS graduate degree programs.
5. Develop and strengthen ties among faculty conducting science-based adult education, community outreach, and K-12 teacher development programs.

The proposed Department of Biology, Health, & Environment can provide leadership for the development and operation of this consortium. In particular, we possess a diverse group of FTT and TT/T faculty who have successfully obtained grants in STEM Education. Our faculty are also currently affiliated with the majority of the listed [College of Science Student Programs](#).

Institutional Models: [Auburn University DBER](#), [University of Georgia Scientists Engaged in Educational Research \(SEER\)](#), [University of Minnesota Department of Biology Teaching & Learning](#), [San Francisco State University Science Education Partnership & Assessment Laboratory \(SEPAL\)](#)

COS Pre-Health Student Training Center

The College of Sciences Pre-Health Student Training Center will provide greater coordination among COS pre-health initiatives, courses, and faculty. As the college with the greatest number of pre-health students and pre-health pre-requisite course offerings (primarily in Integrative Biology, Chemistry, and Physics), COS holds a unique position to positively impact pre-health student success. As the COS department with the largest number of pre-health courses, and a department that already trains and advises thousands of pre-health students each year, IB is well-placed to lead such a COS Center.

The initial focus of this center would be to:

1. Facilitate the implementation of evidence-based practices for pre-health education.
2. Develop pre-health curriculum that meets the needs described by professional schools.
3. Coordinate COS signature experiences and experiential learning opportunities related to health careers.
4. Provide early and continuous advising to pre-health science majors.

Institutional Models & Resources: [National Consortium for Health Sciences Education](#), [TCU Pre-Health Professions Institute](#), [The University of Vermont Health Professions Interest Group](#), [Emory University Health Professions Readiness Education Program \(HealthPrep\)](#), [University of South Florida Pre-Health Scholars Program](#)

Organizational Structure

We propose a departmental structure in the near future with three discipline groups. However, the department's scope is large enough that we feel it is important to work towards a school structure where each group progressively develops more autonomy.

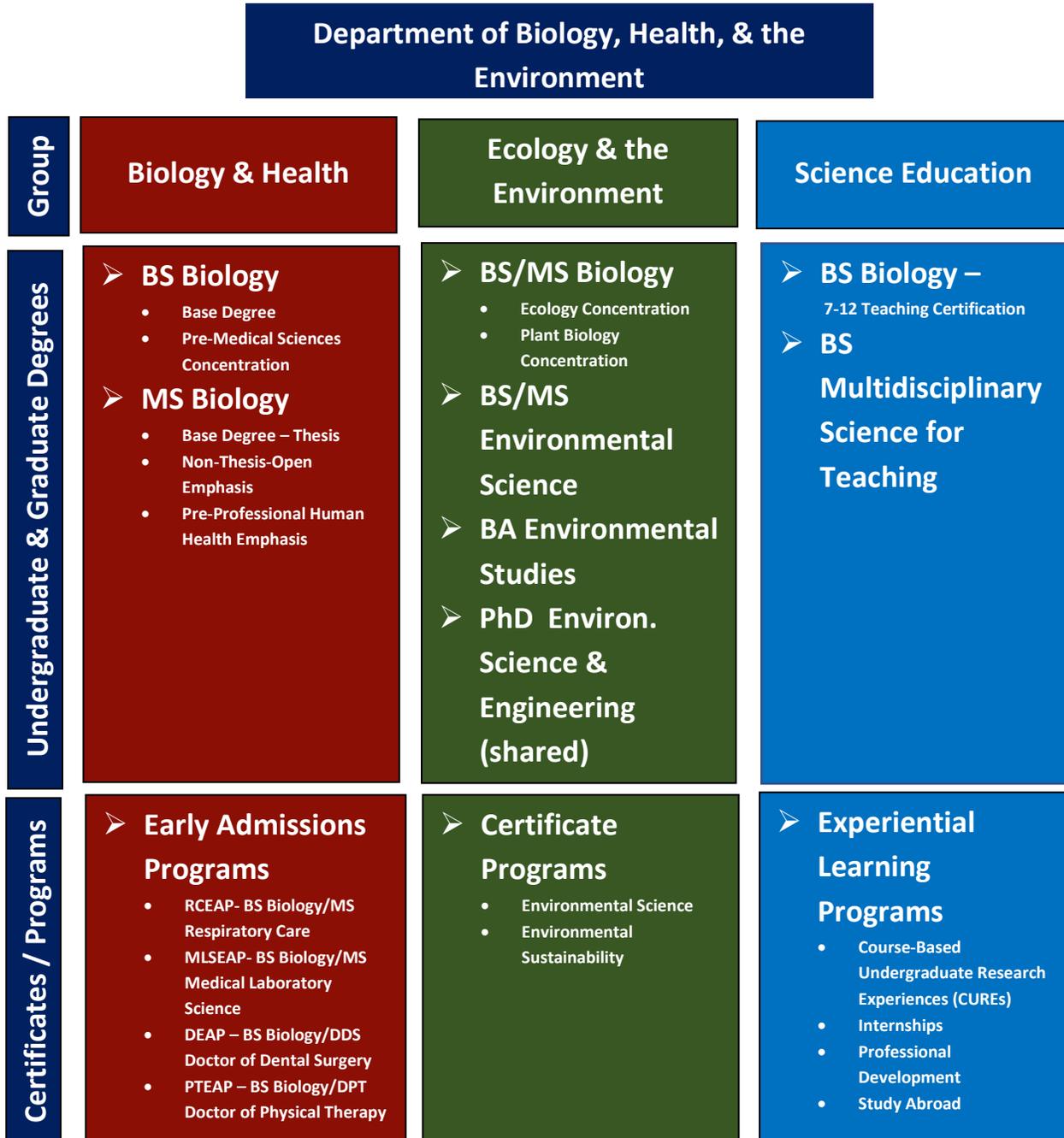


Figure 4. Summary of proposed organizational structure.

D. STRATEGIC PLANNING & IMPLEMENTATION

Existing Departmental Strengths



Figure 5. Self-identified strengths of the Department of Integrative Biology.

Strategic Priorities

The strategic priorities of the Department of Biology, Health, & the Environment follow the departmental objectives listed in [Section C. Re-visioning the Department of Integrative Biology](#). Below, we list specific actions that could be employed to achieve these objectives.

Fundamental and Applied Insights

Objective 1. Contribute fundamental and applied insights into biological systems and the relationships between the health of humans, animals, plants, and the environment.

- **1.1 Build additional research capacity through targeted hires.**
 - Greatest potential in areas that cross multiple department thematic areas (human health, animal & plant health, health of the environment, and science education).
 - Suggested fields for near-term hires include Chemical Ecology, Toxicology, Physiology, Population Genetics, Science Education, Disease Ecology, and Landscape Ecology.
 - Priority should be given to faculty conducting research at intersections/taking integrative approaches (e.g. metabolomics, biochemical signaling, systems biology, plant genomics, ecological data modeling, urban climate mitigation, human dimensions of environmental change, applied water management).

- **1.2 Pursue multi-department research initiatives and cluster hires addressing emerging problems related to health and sustainability.**
 - Areas of interest include climate change, microplastics, and discipline-based educational research (DBER).
 - Potential partners include: Earth & Planetary Sciences, Civil & Environmental Engineering, Public Health, Political Science & Geography, and Environmental Anthropology.

Metrics of Success:

- Increased average number of grant awards per research faculty
- Increased average research expenditures per research faculty
- Increased average number of peer-reviewed research works per research faculty
- Increased number of collaborations with external research partnerships
- Increased % students participating in research opportunities.

Preparing the Next Generation of Scientists, Educators, & Health Practitioners

Objective 2. Prepare the next generation of scientists, educators, and health practitioners to develop holistic solutions to pressing problems related to health and sustainability.

- **2.1 Expand experiential learning opportunities and couple professional certification programs with four-year degrees to build employment potential.**
 - Health-Related Certifications: Emergency Medical Technician, Medical Assistant, Dental Assistant (Potential Partner: UT Health)
 - Sustainability-Related Certifications: Environmental Management & Safety Certifications (e.g. HAZWOPER, OSHA), Certified Wildlife Biologist, Certified Environmental Scientist, Professional Wetland Scientist.

- **2.2 Implement new degree and 3+2 programs that focus on health, sustainability, and the intersections of these areas.** Potential programs include:
 - BS Biology Concentrations: One Health, Food Systems, Computational Biology/AI
 - BS/MS One Health (Potential Partners: Public Health, UT Health)
 - Institutional Models: [University of Maine](#), [UAF](#), [University of Edinburgh](#), [Texas A&M Galveston](#)
 - BS Biology/MPH 3+2 Program (Potential Partner: UT Health)
 - BS Biology/MS Imaging Sciences 3+2 Program (Potential Partner: UTHSCSA)

- **2.3 Increase pre-health student success through the establishment of a pre-health student training center, the development of additional pre-health pathway programs, and the recruitment of faculty with professional backgrounds to assist in providing informed guidance to pre-health majors.**
 - COS Pre-Health Student Training Center
 - MD Pathway Program

- PA Pathway Program
 - FTT Faculty Recruitment: MD, DO, DVM, RN, PA, EMT
- **2.4 Build professional connections by establishing advisory boards for each discipline group.**
- Pre-Health Advisory Board: MD, DO, DVM, DDS, professional school administrators
 - Science Education Advisory Board: teachers, educational administrators, non-profit educators.
 - Ecology & Sustainability Advisory Board: environmental scientists working in public, private, and non-profit sectors.
- **2.5 Harness faculty expertise to increase upper-division and graduate course offerings related to One Health.**
- Suggested offerings for consideration include: One Health & Systems Approaches, Climate Change & One Health, Vector Biology/Medical Entomology, Disease Ecology, Environmental Epidemiology, Communicable Disease Epidemiology, Histology, Conservation Medicine, Zoonotic Diseases, Emerging Infectious Diseases, Ecosystem Health, One Health Policy, GIS for Health Science, Wildlife Disease Management, One Health Approaches to Antimicrobial Resistance, Landscape Ecology, Environmental Microbiology CURE Lab, Food Systems.

Metrics of Success:

- Increased retention rates
- Increased graduation rates
- Increased rates of professional school admission
- Increased % of students gaining employment in degree-related areas
- Increased experiential/research/professional certification opportunities

Building Transdisciplinary Partnerships

Objective 3. Build transdisciplinary partnerships capable of generating transformational impact across the fields of human health, sustainability, and science education.

- **3.1 Expand collaborative UTSA health and sustainability initiatives, targeting strategic focus areas such as agricultural sustainability/regenerative agriculture, livable urban spaces, aquatic resource management, and climate change.**
- Partners: Earth & Planetary Sciences, Chemistry, Civil & Environmental Engineering, Environmental Anthropology, Political Science & Geography, Molecular Microbiology & Immunology, Public Health, Inter-Disciplinary Learning & Teaching, Data Science, Honors College, University College.

- **3.2 Foster existing partnerships and build new local, state, regional, and national relationships (public, private, and non-profit) to assess and address global threats to the health of humans, animals, plants, and the environment.**
 - Example Partners: UT Health, City of San Antonio, US Fish & Wildlife, Texas Parks & Wildlife, Edwards Aquifer Authority, San Antonio River Authority, Chicago Field Museum, Howard Hughes Medical Institute

Metrics of Success:

- Increased # internal & external partnerships
- Increased # of projects with partners

Translating Research into Practice

Objective 4. Translate research into practice through model educational initiatives, community-engaged research, and participatory processes.

- **4.1 Coordinate discipline-based educational research (DBER) through the formation of the Science Education Advancement Consortium.**
 - Initiate SEA Consortium collaborative discussions & strategic planning.
 - Initiate and coordinate teams for grant & research opportunities.
 - Implement data and research support systems.
 - Harness large quantities of data from CUREs and large introductory courses.
 - Couple instructional initiatives with research outcomes.
 - Consolidate and expand training programs in higher-ed STEM education within COS graduate degree programs.
 - Develop and strengthen ties among faculty conducting science-based adult education, community outreach, and K-12 teacher development programs.
- **4.2 Implement evidence-based student success practices targeting student retention rates, graduation rates, and career preparation.**
 - Implement best-practices through expanded course coordination, faculty development efforts, and formation of Faculty Interest Groups.
 - Grow experiential learning and undergraduate research opportunities such as CUREs and placement in faculty research labs.
 - Provide early and continued advising and biology-focused professional development.
 - Target Freshmen with skills-based boot camps and the formation of Freshman Interest Groups.
 - Continue to support and expand existing peer mentoring programs.
 - Increase research and internship opportunities for graduate students.

- **4.3 Build collaborative inter-disciplinary community outreach programs to educate local, state, regional, and national communities about their role in maintaining healthy environments and urban systems.**
 - Harness increased funding opportunities from local, state, and federal agencies to implement environmental health education.
 - Avail our researchers and their expertise to assist local and state partners in strategically managing threats to health and sustainability.

Metrics of Success:

- Increased # faculty DBER practitioners at UTSA
- Increased total student enrollment
- Increased first-year retention rates
- Increased 4-year graduation rates
- Increased 6-year graduation rates
- Increased # students with experiential learning & research experience
- Increased participation of students in student success programs (orientation, peer-mentoring, student clubs, study space)
- Lower DFW rates (especially from first-generation and URM groups)
- Increased # of students obtaining jobs in Biology fields or enrolling in professional/graduate programs upon graduation
- Increased # of outreach events and contacts with community
- Increased # project/grant applications in collaboration with local and state partners
- Increased media reach/# interviews

Tentative Timeline

Strategic actions listed above were categorized into three categories: Short-Term (1-2 years), Long-Term (3-5 years), and Exploration Potential. Actions listed in the Exploration Potential category require additional feasibility assessment and can fall within either Short-Term or Long-Term time frames.

STRATEGIC ACTION	Short Term (1-2 Years)	Long Term (3-5 years)	Exploration Potential
1.1 Build Research Capacity Through Targeted Hires			
<ul style="list-style-type: none"> Chemical Ecology, Toxicology, Physiology, Population Genetics, Science Education 			
<ul style="list-style-type: none"> Disease Ecology, Landscape Ecology 			
1.2 Pursue multi-department research initiatives and cluster hires addressing emerging problems related to health and sustainability.			
<ul style="list-style-type: none"> DBER, Climate Change, Microplastics 			
2.1 Expand experiential learning opportunities and couple professional certification programs with four-year degrees to build employment potential.			
<ul style="list-style-type: none"> Emergency Medical Technician Certification 			
<ul style="list-style-type: none"> Medical & Dental Assistant 			
<ul style="list-style-type: none"> Certified Wildlife Biologist 			
<ul style="list-style-type: none"> Certified Environmental Scientist 			
<ul style="list-style-type: none"> Environmental Management & Safety Certifications 			
2.2 Implement new degree and 3+2 programs focusing on health, sustainability, and the intersections of these areas.			
<ul style="list-style-type: none"> BS Biology Concentration in One Health 			
<ul style="list-style-type: none"> BS Biology Concentrations: Food Sys., Comp. Bio / AI 			
<ul style="list-style-type: none"> BS/MS One Health 			
<ul style="list-style-type: none"> BS Biology/MPH 3+2 Program 			
<ul style="list-style-type: none"> BS Biology/MS Imaging Sciences 3+2 Program 			
2.3 Increase pre-health student success through the establishment of a COS pre-health student training center, the establishment of additional pre-health pathway programs, and the recruitment of faculty with professional backgrounds to assist in providing informed guidance to pre-health majors.			
<ul style="list-style-type: none"> COS Pre-Health Student Training Center 			
<ul style="list-style-type: none"> MD Pathway 			
<ul style="list-style-type: none"> PA Pathway 			
<ul style="list-style-type: none"> FTT Recruitment: MD, DO, DVM, RN, PA, EMT 			

2.4 Build professional connections by establishing advisory boards for each discipline group.			
• Pre-Health, Science Ed, Ecology & Sustainability			
2.5 Harness faculty expertise to increase upper-division and graduate course offerings related to One Health.			
• Undergraduate Catalog Revision			
• Graduate Catalog Revision			
3.1 Expand collaborative UTSA health and sustainability initiatives, targeting strategic focus areas such as agricultural sustainability/regenerative agriculture, livable urban spaces, aquatic resource management, and climate change.			
• Collaboration Development			
3.2 Foster existing partnerships and build new local, state, regional, and national relationships (public, private, and non-profit) to assess and address global threats to the health of humans, animals, plants, and the environment.			
• Partnership Development			
4.1 Coordinate discipline-based educational research (DBER) & its application through the formation of the Science Education Advancement Consortium.			
• Initiate SEA Consortium collaborative discussions & strategic planning.			
• Initiate and coordinate teams for grant & research opportunities.			
• Implement data and research support systems.			
• Harness large quantities of data from CUREs and large introductory courses.			
• Couple instructional initiatives with research outcomes.			
• Consolidate and expand training programs in higher-ed STEM education within COS graduate degree programs.			
• Develop and strengthen ties among faculty conducting science-based adult education, community outreach, and K-12 teacher development programs.			
4.2 Implement evidence-based student success practices targeting student retention rates, graduation rates, and career preparation.			
• Implement best-practices through expanded course coordination, faculty development efforts, and formation of faculty interest groups.			
• Grow experiential learning and research opportunities			
• Provide early and continued advising and biology-focused professional development.			

<ul style="list-style-type: none"> • Target Freshmen with skills-based boot camps and the formation of Freshman Interest Groups. 			
<ul style="list-style-type: none"> • Continue to support and expand existing peer mentoring programs. 			
<ul style="list-style-type: none"> • Increase research and internship opportunities for graduate students. 			
4.3 Build collaborative inter-disciplinary community outreach programs to educate local, state, regional, and national communities about their role in maintaining healthy environments and urban systems.			
<ul style="list-style-type: none"> • Harness increased funding opportunities from local, state, and federal agencies to implement environmental health education. 			
<ul style="list-style-type: none"> • Avail our researchers and their expertise to assist local and state partners in strategically managing threats to health and sustainability. 			

E. CONCLUSIONS & RECOMMENDATIONS

Working Group Conclusions & Recommendation

It is the unanimous recommendation of this working group to re-vision the Department of Integrative Biology as the Department of Biology, Health, and the Environment—a department dedicated to solving the health and sustainability challenges of the 21st century through inter-disciplinary research in biological systems, transformative education, and the One Health paradigm.

From the [United Nation’s Sustainable Development Goals](#) to the [World Health Organization’s One Health Initiative](#), growing global consensus highlights the importance of understanding and harnessing the connections between the health of people, plants, animals, and the environment. In recognition that this “One Health” paradigm will be central to meeting the health and sustainability needs of the future: US government agencies from the CDC to the DOA to the USGS have all published One Health statements; the number of NGOs and Coalition Organizations working under the guiding principle of One Health is growing quickly; and academic organizations around the world have begun to develop One Health programs.³

The visioned department will be at the forefront of this growing movement, transforming how universities train the scientists, educators, and health professionals of the future. In particular, its innovative structure will couple research and expertise in health and environmental systems with that in science education, highlighting the inter-connectedness of these fields to successfully combat emerging threats to both humans and the environment. Moreover, as one of the first departments of its kind, the visioned department will contribute to all three [UTSA Strategic Destinations](#)—student success, research excellence, and innovation.

We see the visioned department as a natural progression of the Department of Integrative Biology’s trajectory that builds upon existing department strengths, aligns with faculty and student interests, and provides increased clarity of focus and identity formation. The Department of Integrative Biology is the largest department on campus, with six degree programs, 2695 majors, and a large service role that provides pre-health and core education to students across the university. In any given year, IB contacts over 20% of UTSA’s students, and the majority of these students are interested in careers in health and/or sustainability. Likewise, existing faculty expertise and course offerings fall solidly within these areas.

Last, IB’s successful funding record in fields that support the proposed vision couples with this strong student demand and widespread faculty backing to suggest that the internal and external support exists to provide a solid foundation for the visioned department. In 2023, IB secured an average of \$953,200 per research-active faculty member from agencies such as NIH, the US Department of Agriculture, and the US Fish & Wildlife Service. The total amount received exceeded \$11 Million and was the second largest amount received by a department in the College of Sciences (following Computer Science). Given this success, the visioned department will be positioned well as funding agency interest in the One Health concept grows.

Potential Challenges

Conversations among the working group and with IB faculty and staff as a whole reflected widespread support for the visioned concept. However, they also highlighted several challenges that will need to be addressed in order for the proposed vision to succeed. The majority of these conversations centered on resource allocation and balancing the different interests of faculty and student groups. In particular, while the Department of Integrative Biology has been successful—in terms of both teaching and research excellence—it possesses a unique departmental composition that presents its own strengths and challenges.

Discussed challenges included:

Balancing faculty and student interests across the three discipline groups: As the largest Department on campus, the size of IB and diversity of its students present their own challenges. Charting a new unified path forward will require intentionality in messaging, hiring, and resource allocation. In particular, priority should be given to faculty candidates and program additions at the intersection of the thematic areas (human health, plant & animal health, health of the environment, and science education), such that they can support multiple student populations. Moreover, as the department grows, re-visiting the idea of a school that facilitates the common mission while allowing for increased autonomy among discipline groups may yield benefits.

TT/T faculty lines: With 53 total faculty, only 12 of these faculty are TT/T and not all of these TT/T faculty are research-active. No TT/T lines were allocated to IB in its first three years (2021-24) and we have lost four TT/T faculty. The current student to TT/T faculty ratio in IB is 224:1, over 4x the college average. In moving forward, TT/T faculty hires in areas such as Chemical Ecology, Physiology, Toxicology, Population Genetics, Science Education, Landscape Ecology, and Disease Ecology will be critical to the department's success. These hires will not only support the department's research mission; they will also support the university's teaching mission through greater student opportunities for experiential learning, research experiences, and professional development and guidance.

FTT Faculty that can support the professional development of pre-health students: FTTs in IB play an essential role in curriculum development and instruction, departmental governance, student success initiatives, and in some cases, research and graduate education. These contributions have been central to the department's success and will be a vital part of the department's future. However, while we have been successful in recruiting a large number of quality FTTs, we continue to receive requests from the administration to offer additional sections and courses to meet growing student demand. In particular, we have identified the need to recruit more faculty with human health-related professional experience that can support our Anatomy & Physiology programs and guide pre-health students. This need not only impacts students in IB; it impacts pre-health students across the university. In addition to our 2,695 majors, we served 1,898 students from HCAP and 1,340 students from University College in 2023-24. As the university continues to grow, this demand on IB for pre-health student education is projected to increase.

Additional Administrative Support & Space: As the largest department at UTSA, with an extensive mission in pre-health and core education and a growing research footprint, the strategies and mechanisms suggested in [Section D. Strategic Planning & Implementation](#) will require both additional administrative support and space.

A Path Forward

Implementation of the re-visioned concept can begin immediately. The path forward starts with re-branding and initiating the process for name-change approvals. However, there is a great deal of work to be done—ranging from catalog revisions to formation of hiring committees, solicitation of partnerships, and early-stage planning for suggested consortia and centers. It is the recommendation of this working group that the development and execution of an implementation plan proceed in a participatory manner. IB faculty and staff have provided feedback at every stage of this re-visioning process and they are ready to collectively implement their vision.

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